DOCUMENT RESUME

ED 345 209 CS 010 931

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TITLE Children at Risk: Their Phonemic Awareness Development in Holistic Instruction.
INSTITUTION Illinois Univ., Urbana. Center for the Study of Reading.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO CSR-TR-556
PUB DATE May 92
CONTRACT G0087-C1001-90
NOTE 56p.
PUB TYPE Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Beginning Reading; Grade 1; *High Risk Students; *Holistic Approach; Instructional Effectiveness; Invented Spelling; Primary Education; Reading Achievement; *Reading Instruction
IDENTIFIERS Emergent Literacy; *Phonemic Awareness

ABSTRACT

A study examined the development of phonemic awareness and its relationship to beginning reading among 20 first-grade children at risk for failing to learn to read and write. Their instructional programs were observed; their levels of reading, writing, and phonemic awareness development were measured in October and April; and their home literacy experiences were surveyed by questionnaire. Findings corroborated previous investigations in two ways: (1) phonemic awareness is necessary, but not alone sufficient for reading success; and (2) measures of invented spelling are not only reliable indicators of phonemic awareness, but correlate strongly with reading achievement. Findings also show that instruction that includes repeated readings of predictable text and opportunities for writing using invented spelling contributes to phonemic awareness development. Finally, the findings suggest that home literacy activities, both before school entry and during first grade are also influential in the development of children's phonemic awareness. (Eight tables of data are included; 45 references and 3 appendixes--containing selection criteria for classrooms and focal children; the test battery for assessment of phonemic awareness, reading, and writing; and the parent questionnaire--are attached.) (Author/SR)

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ED345209

CENTER FOR THE STUDY OF READING

Technical Report No. 556

CHILDREN AT RISK: THEIR PHONEMIC AWARENESS DEVELOPMENT IN HOLISTIC INSTRUCTION

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May 1992

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Abstract

The development of phonemic awareness and its relationship to beginning reading was examined among 20 first-grade children at risk for failing to learn to read and write. Their instructional programs were observed; their levels of reading, writing, and phonemic awareness development were measured in October and April; and their home literacy experiences were surveyed by questionnaire. The findings corroborate previous investigations in two ways: (a) phonemic awareness is necessary, but not alone sufficient for reading success, and (b) measures of invented spelling are not only reliable indicators of phonemic awareness, but correlate strongly with reading achievement. The findings show also that instruction that includes repeated readings of predictable text and opportunities for writing using invented spelling contributes to phonemic awareness development. Finally, the findings suggest that home literacy activities, both before school entry and during first grade are also influential in the development of children's phonemic awareness.

CHILDREN AT RISK: THEIR PHONEMIC AWARENESS DEVELOPMENT IN HOLISTIC INSTRUCTION

Generations of research and inquiry have endeavored to dispel the mystique that surrounds both the processes of reading and writing and their related pedagogy. The object of much recent classroom and experimental research in the ongoing quest for understanding has been phonemic awareness, the conscious knowledge of phonemes (the smallest identifiable units of sound). Phonemic awareness, specifically its development among at-risk children, is also the concern of the study described in this report.

In her comprehensive review of the literature pertaining to beginning reading, Adams (1990) leaves no doubt about the importance of phonemic awareness to reading success. She states: "Faced with an alphabetic script, children's level of phonemic awareness on entering school may be the single most powerful determinant of their success . . . in learning to read" (p. 54). In other words, possessing phonemic awareness is associated with reading success. What then, can teachers expect of the child who begins school without awareness of the phonological structure of language?

Training studies have determined that specific instruction to increase children's phonemic awareness, to bring the sound system of the language into their conscious awareness, can effectively raise their level of phonemic awareness and benefit their reading achievement (Ball & Blachman, 1988; Cunningham, 1989; Wallach & Wallach, 1976; Williams, 1979). Holistic programs of instruction, those that are largely concerned with meaningful language units, however, are not likely to provide specific instruction similar to that of the training studies. The question that then arises is: If instruction with the primary intent of raising a child's level of phonemic awareness is not offered, are there activities, included in holistic classroom instruction for other primary purposes, that contribute to phonemic awareness development?

In our study, we examined the development of phonemic awareness and its role in the early reading and writing of 20 first-grade children identified by their teachers as at risk for failure to learn to read and write. As part of our examination, we observed the children's holistic language arts instruction (instruction characterized by an emphasis on reading and writing meaningful units of text) to determine the presence of activities that might possibly contribute to phonemic awareness development. In addition to their classroom learning opportunities, we also surveyed the children's home literacy experiences. Finally, we reviewed the observations and achievement data to identify possible patterns of interrelationship between phonemic awareness and reading and writing.

Linguistic Terminology

Before continuing, some explanation of the linguistic terminology we employed seems appropriate.

At its most basic level, speech consists of continuously variable waves of acoustic energy. One step removed from the basic acoustic level is the phonetic level. At this level, speech is represented by phones, an exhaustive set of speech sounds. For example, the /p/ in *pen* and the /p/ in *stop* are technically two different phones, but this distinction is not perceived in everyday speech. It is the perceived distinctions such as the /p/ and /n/, referred to as *phonemes*, that are of interest to this discussion.

Briefly, a *phoneme* consists of a group of phones that speakers of a language consider to be variations of the same sound (Balmuth, 1982, cited in Wagner & Torgesen, 1987). Each phoneme is usually represented by one or two letters. Being cognizant that words are composed of phonemes (individual sounds) and that speech is a chain of these meaningless, yet perceptually distinct, sounds is referred to as *phonemic awareness*.

Because the English alphabet represents phonemes rather than the larger units of syllabaries and logographies, the beginning reader must learn to appreciate phonemes and their place in spoken and written language. Three tasks are conventionally associated with gaining that necessary appreciation: *segmentation* (breaking of words into syllables or phonemes), *blending* (linking phonemes together to form the usual pronunciation of words), and *deletion* (ability to omit one or more phonemes in pronouncing a word). The capacity to make one or all of these manipulations of the language constitutes the reference for *phonemic awareness* in much of the literature.

Relationship Between Phonemic Awareness and Reading

Despite extensive investigation, the exact nature of the relationship of phonemic awareness to reading and writing remains unspecified. Two observations, however, seem certain: a dependent relationship exists between phonemic awareness and reading (Bradley & Bryant, 1983; Cunningham, 1989; Elkonin, 1973; Tunmer & Nesdale, 1985) and a predictive relationship exists between invented spelling (attempts to encode prior to learning conventional spelling) and phonemic awareness development (Liberman, Rubin, Duques, & Carlisle, 1985; Lundberg, Olofsson, & Wall, 1980; Mann, Tobin, & Wilson, 1987). We will review the evidence for each in turn.

Traditionally, the dependent relationship between reading and phonemic awareness has been perceived in three ways: Phonemic awareness may be a prerequisite, a facilitator, or a consequence of reading. A fourth possibility, that phonemic awareness and reading have an interactive relationship, has more recently been proposed and demonstrated (Ehri & Wilce, 1987; Perfetti, Beck, Bell, & Hughes, 1987). That is, reading skill is dependent upon phonemic awareness while at the same time reading text contributes to phonemic awareness development.

One of the most convincing studies showing phonemic awareness as a prerequisite for reading is that by Tunmer and Nesdale (1985). They hypothesized that if the knowledge is necessary, then it would be impossible to make progress in learning to read without it and subsequently, that all accomplished readers would have it. If, on the other hand, phonemic awareness is a facilitator, having the skill would ease acquisition of reading proficiency, but it should be possible to find readers who do not have it. They further reasoned that if phonemic awareness development is a result of learning to read, then training to increase awareness and prior differences should have no effect on acquisition of reading skills.

Using a corpus of words containing equal numbers of real words and pronounceable pseudowords, they found no students who performed poorly on phonemic segmentation but well on decoding. There were, however, some students who were able to segment, but who were poor decoders. Thus, from their measurements of phonological segmentation and reading comprehension, they reasoned that the relationship between phonemic awareness and reading is not one of total sufficiency. Rather, they concluded phonemic awareness is necessary, but not alone adequate for the acquisition of phonological recoding skills.

In a proposed model of literacy acquisition Juel, Griffith, and Gough (1986) agree that phonemic awareness is necessary, but not sufficient, for reading. From their longitudinal study of first- and second-grade children in which phonemic awareness was measured in a number of ways, they found that phonemic awareness strongly influenced year-end performance in spelling, word recognition, writing, and reading comprehension for both first and second graders. Juel et al. subsequently reasoned that children can be exposed to print, but still not develop knowledge of sound-symbol associations unless the phonemic awareness is in place first or occurs early in the print exposure. Juel et al. concluded that oral phonemic awareness training should be provided for all children entering first grade with poor phonemic awareness.

Although it has been demonstrated that phonemic awareness is a prerequisite to reading, this does not preclude its further development after initial reading success. In a longitudinal study of first-grade children, Perfetti et al. (1987) proposed that reading and phonemic awareness develop in tandem. It is possible, they contended, that a certain amount of reading ability can be acquired through visual memory without significant phonemic awareness, but that eventually reading of an alphabetic orthography requires phonemic awareness, and further, experience with print promotes phonemic awareness.

So far, the picture appears quite clear: Some phonemic awareness is necessary in order to process print (decode) successfully and, in turn, decoding print contributes to greater understanding of the phonological properties of the language. The third hypothesized possibility, that readers acquire explicit knowledge of the phonological structure of the language as a result of learning to read, casts an uncertain haze over the picture and must be considered carefully. Evidence of this possibility is apparent in two studies that involved adults.

Morais, Cary, Alegria, and Bertelson (1979) tested illiterate and formerly illiterate adults in Portugal on tasks of addition and deletion of phonemes and found that the illiterate adults scored significantly less accurately (19%) than the readers (71% and 73%). Similar conclusions were derived from experimental evidence of Chinese readers by Read, Zhang, Nie, and Ding (1986), who compared the phonemic awareness of Chinese readers trained only in reading logographic Chinese characters with Chinese readers who had learned the alphabetic *pinyin*. The *pinyin* readers significantly outperformed the logographic readers. These studies, however, do not discount prerequisite and facilitation hypotheses, particularly concerning young children. At the very least they provide evidence that learning to read an alphabetic writing system contributes to the development of phonemic awareness, and may, in some instances, constitute the instruction necessary for the development of phonemic awareness.

In summary, the relationship of phonemic awareness to reading is complex. It is likely that a minimal level is necessary for initial decoding success. Continued decoding experience may change the nature of the relationship to one best described as interactive. To consider phonemic awareness simply a consequence of reading, however, is not as easily rationalized. There is too much evidence of reading failure in its absence to think that the roles are exclusive. What is feasible is that it is slightly different phonemic knowledge that is necessary for reading to be learned than is resultant of decoding experience. Just as learning to read is a developmental process with no clear markers of when it is there and when it is not, the development of phonemic awareness appears to be a continuous rather than a distinctly incremental process.

Relationship Between Phonemic Awareness and Writing

For several decades we have recognized that the processes of reading and writing are interrelated. Recent studies have continued to address the relationship between the two. More specifically, the association of invented spelling (attempts to encode prior to learning conventional spelling) with phonemic awareness development has been shown as a predictive relationship (Juel et al., 1986). That is, a young child's control over the sound-symbol system of the language as demonstrated in attempts to write is an indication of his or her later reading success.

Zifcak (1981) compared three measures of phonemic awareness (Test of Auditory Analysis Skills [Rosner, 1971], segmentation, and spelling) with reading success and found that taken together, invented spelling and phonemic segmentation provided the most reliable basis for predicting a child's ability to learn to read. Further, the tasks of invented spelling and phonemic segmentation were strongly and positively correlated with each other. Performance on these tasks suggests that good readers possess an awareness of abstract linguistic relationships at the phoneme level, a level that facilitates meaningful interaction with the alphabetic writing system of the English language. This knowledge can be reliably

measured through tests of invented spelling and, therefore, it is logical that practice in spelling might facilitate mastery over the relationship between spoken words, phonemes, and ultimately, printed words.

Further exploration of the relation of invented spelling to the development of linguistic knowledge was conducted by Liberman et al., (1985). In addition to other language and reading tasks, kindergartners were asked to write a dictated, real-word spelling test. Their spellings were rated on two dimensions: the number of phonemes represented and the level of orthographic representation. Ninety-three percent of the variance in the children's invented spelling performance was accounted for by phoneme segmentation, ability to write from phoneme dictation, and phoneme deletion. Liberman et al. (1985) concluded that not only is spelling skill predictive of reading ability, but that spelling skill develops systematically as young children master the ability to analyze words into their constituent phonemes.

In summary, there is evidence to conclude first that invented spelling is a reliable predictor of reading achievement (Juel et al., 1986; Mann et al., 1987; Zifcak, 1981) and second that invented spelling is a reliable measure of phonemic awareness. There is reason then to reconsider its place in contemporary holistic classrooms. If it is, indeed, a reliable predictor it may also be a significant, easily facilitated and valuable means of training phonemic awareness.

Relationship Between Phonemic Awareness and Instruction

The success of both individual training tasks (Ball & Blachman, 1988; Cunningham, 1989; Elkonin, 1973; Olofsson & Lundberg, 1983) and more extensive instructional programs (Clay, 1985; Wallach & Wallach, 1976; Williams, 1979) leaves little doubt that phonemic awareness can be taught. How it is best taught, however, remains unclear. A complete taxonomy of effective instruction yet eludes both the literature and commercial publishers, but several conclusions about the sequence and content of beneficial instruction can be drawn. First, the tasks of effective instruction are diversified in both demands and activities. Those that are most effective focus on segmentation and blending of phonemes, limit memory requirements, include concrete markers of phonemes (Elkonin, 1973), and include reflection on the link between skills and application to reading (Cunningham, 1989). With respect to the markers, it is logical that these indicators could be, at least at some point, the representative graphemes (Bradley & Bryant, 1983; Hohn & Ehri, 1983). Second, much instruction has been successfully presented as games (Ball & Blachman, 1988; Olofsson & Lundberg, 1983; Zhurova, 1963). Finally, as previously alluded, writing using invented spelling is also a plausible form of instruction.

Understanding of the contribution of classroom programs of reading and writing instruction to the development of phonemic awareness is incomplete. Some preliminary explorations have been made, but much is yet unknown particularly about the effect of holistic reading and writing instruction. More specifically, although the influence of various instructional approaches to classroom reading instruction has been examined, little attention has been paid directly to writing instruction (including spelling) and the development of phonemic awareness.

Tunmer and Nesdale (1985) hypothesized two opposing possibilities about instruction. First, not only would it greatly influence phonemic awareness, but code-emphasis and meaning-emphasis instruction would produce differences in the development of phonemic awareness. Alternatively, phonemic awareness could develop largely independently of reading instruction.

Half of the classroom programs they involved were meaning-emphasis programs that provided no incidental or formal instruction in phonological skills: The other half were eclectic programs that included a heavy emphasis on the teaching of phonics. Their correlations between measures of reading achievement (real-word decoding, pseudoword decoding, and comprehension) and method of instruction were highly significant, but the correlation between method of instruction and phoneme segmentation ability did not reach significance. Further, the children who were able to segment, but who were poor

decoders, were evenly distributed across both types of programs. Thus, there is reason to believe that reading instruction does influence phonemic awareness development (as opposed to phonemic awareness developing independently of instruction), but no reason to conclude that a decoding-emphasis program is of greater influence on segmentation.

Later investigations by Perfetti et al. (1987) and Morais (1987a) cast some doubt on this conclusion. Perfetti et al. found that children in their code group outperformed their basal group on tasks of segmentation, while the reverse was true on tasks of phoneme deletion. Morais reached similar conclusions from a comparative study of first graders taught to read by phonic and whole-word methods. On a phoneme-reversing task, phonics method children out performed whole-word students suggesting greater benefit to phonemic awareness development of phonics-emphasis instruction.

Direct comparisons are difficult: They should be made with caution because the tasks involved in these studies differ, particularly in memory demands. There is, however, general consensus that instruction influences phonemic awareness development and that code-emphasis, whole word, and basal methodologies do not appear to contribute equally to phonemic awareness.

If phonemic awareness development and reading and writing are interdependent, then it stands to reason that approaches to instruction that facilitate recoding (as phonics-emphasis does) should contribute more to phonemic awareness development than whole-word instruction. Further, conclusions about what learning activities contribute significantly to phonemic awareness development must not be drawn hastily. Within any approach, particularly those of an eclectic nature, instruction may be present, but unidentified as such. In addition, it must be remembered that even though instruction influences phonemic awareness development, children can and do discover the phonetic structure of language when it is not explicitly taught to them (Alegria, Morais, & D'Alimonte, cited in Morais, 1987b).

Conclusions regarding the relationship of phonemic awareness development to instruction are limited. Existing studies that consider the contribution of classroom instruction are limited to somewhat traditional methodology, and there is little consistency in the measurement tasks used and the aspects of phonemic awareness assessed. At the time of our study, no existing studies described phonemic awareness instruction within programs of a more contemporary holistic nature, or of what have been labeled whole language programs. The key features of these programs are introducing text through reading whole selections followed by repeated readings by the children, extensive reading of tradebooks rather than basal readers, and an emphasis on writing as a means by which children can gain mastery over printed language. Further, although investigations of explicit instructional schemes have offered guidelines for effective instruction, the lack of compatibility of these schemes with holistic principles creates a problematic chasm. Finally, previous studies have not taken into account the possible and likely influence of home literacy experiences. Without this information, the records of the relationship between phonemic awareness and reading are simply incomplete. This study attempts to fill that void.

Research Questions

Four questions guided our study: (a) Is phonemic awareness development facilitated in holistic instructional programs? (b) If so, how? (c) What is the nature of the relationship between phonemic awareness development and acquisition of reading and writing skills among children who enter holistic first-grade language arts instruction at risk for failure to learn to read and write? (d) How do home literacy experiences affect phonemic awareness development?

METHOD

Setting

Four first-grade classroom instructional programs were selected on the basis of recommendations of supervisory personnel, teacher descriptions, and preliminary observations. The most important criterion was the use of a holistic instructional approach as evidenced by inclusion of tradebooks in the reading instructional material; selective use of basal reading materials; extensive opportunity for student writing; and little, if any, explicit phonics instruction. The criteria that guided selection of classroom and focal children are contained in Appendix A.

Two classrooms, Mrs. Alward's and Mrs. Frazee's, were located in a midwestern suburban school with a population of 546 students, approximately 5% of whom came from low-income families. The other two classrooms, Miss Miller's and Miss Scott's, were located in a small midwestern city school with a total population of 287 students, approximately 58% of whom came from low-income families.

Participants

Five children from each classroom were selected as focal children: 8 girls and 12 boys, whose mean age was 6 years 7 months (80.1 months, *SD* 4.68) in October, comprised the total group for observation. Teachers considered the children to be of average intelligence, but at risk for failure to learn to read and write on the basis of poor performance on classroom language tasks, seeming inexperience with printed language, and need for repetition and extensive practice to grasp new language skills.

Data Sources and Analyses

Observations. Each classroom was observed for 10 full days between October and April. Instruction outside of the classroom was observed when two or more focal children were involved. The observer's role was that of a participant-as-observer (Gold, 1958, cited in Denzin, 1989), meaning that the observer occasionally participated in classroom activities, but was not involved in the planning of instruction. Observations, focused on the instruction and materials presented to the focal children, were recorded in fieldnotes and checklists. Particular attention was paid to the mode of presentation of reading selections, instruction concerned with phonological information, and the interactions surrounding writing activities. These were later reviewed, elaborated, and transcribed to form the "cooked" (Spradley, 1980) notes that were the basis of further analysis.

Analysis of fieldnotes was ongoing through a process of continuous comparison (Glaser & Strauss, 1967) to identify recurring themes and programmatic events relevant to the development of phonemic awareness and reading ability. To establish the trustworthiness (Lincoln & Guba, 1985) of the recorded observations, teachers read them and confirmed their accuracy.

Individual assessments. Each focal child was assessed in October and April on 10 measures: blending, segmentation, and deletion of phonemes; segmentation of sentences into words; invented spelling; sentence dictation; vocabulary writing; alphabet recognition; word recognition; and reading connected text. Tests included investigator-designed measures, items from Clay's (1985) Diagnostic Survey, and Sawyer's (1987) Test of Awareness of Language Segments (TALS). Further description of the tasks, administration procedures, and scoring techniques are contained in Appendix B.

Teacher interviews. Teachers were semi-formally interviewed twice, each time for approximately one hour. Informal information exchanges occurred sporadically throughout the study. Initial interviews in October focused on the teacher's overall program organization, and more specifically, the instructional approach taken to the language arts. Final interviews in April probed, in depth, the teachers' theoretical

orientation to language arts instruction, including their perception of phonemic awareness and its role in learning to read and the instruction they provided. Interviews were transcribed and statements composed to delineate each teacher's beliefs. Teachers endorsed these written statements.

Children's interviews. The focal children were interviewed (prior to final individual assessments) with respect to their perceptions of the reading and writing processes and of themselves as readers and writers. Responses were tallied and organized into naturally emerging categories to reveal their perceptions both individually and as four groups. For validation, transcriptions of the children's comments were shared with their teachers, who concurred that the responses were consistent with their understanding of the children.

Parent questionnaires. Parents (or guardians) of the 20 focal children indicated their child's participation in a list of preschool language learning activities and ongoing experiences with print outside of school. The complete inventory of activities appears in Appendix C. Response rate was 90%. The number of activities indicated for each child was tallied and summed to obtain a group frequency. Each group frequency was converted to a proportion of the total possible so that cross-group comparisons could be made.

RESULTS

Observations

As is to be expected in working with naturally occurring instruction, the four classroom programs varied somewhat in terms of the amount of time children spent reading tradebooks; the use of basal materials; the approach to and time spent in writing; the teacher's theoretical orientation; and the instruction provided regarding sound-symbol associations. What follows is a summary of the nature of the instruction together with an illustrative observed incident from each classroom.

Alward and Frazee programs. The Alward and Frazee programs are indistinguishable. In these, language arts instruction is both inter-correlated and correlated with all other areas; meaning construction is the ultimate goal. Specific literacy skills (including phonics), sometimes addressed explicitly through listening and spelling tasks, are ultimately viewed as means of supporting meaning-making; extensive experience is offered with children's literature and up-to-date basal reading materials, and writing is approached through writers workshop in a manner similar to that described by Atwell (1987).

Mrs. Frazee's introduction to Lobel's (1984) "Very Tall Mouse and Very Short Mouse" illustrates instruction typical of both classrooms, including repeated readings. The class sat comfortably on the carpet in front of her. She asked them to think about and offer ideas of things they were presently too short to do. Several suggestions were given including being too short to reach the cookie jar, to ride a sister's bicycle, or to touch the stars. The discussion then switched to being too tall. With these concepts clarified, the children took a momentary break to "bend and be very short" and "stretch and be very tall."

Mrs. Frazee then read the selection dramatically: She did not show the pictures or text, and asked only that the children listen. After the first reading, each child was given a reader and asked to follow the text and read as much as possible during the second reading. Mrs. Frazee led reading in unison, pausing occasionally to offer help to children who lost their places. The children read along with some inconsistencies, but always joined in on the repeated phrases. Discussion of the use of quotation marks followed.

"Who are the characters and what are they doing?" Mrs. Frazee asked.

Sebastian replied, "They are talkin[illegible]"

"How do we know?" Mrs. Frazee queried further. Several children tried to say quotation marks, but none was successful. Mrs. Frazee enunciated clearly as she wrote the word *quotation* on the board. She spoke the word in syllables and asked for spelling assistance: "Quo-ta-tion, how do we write that word?" Momentarily she wrote the *q* and stated, "*q* is always followed by its friend *u*. You can hear the /o/ and the /t/ and the /a/." Laura added, "/shun/ s-h."

Mrs. Frazee responded, "/shun/ is sort of difficult, this time I'll tell you, t- i- o-n."

They read the word *quotation* in unison and looked again at the marks on the page. Mrs. Frazee referred to the marks as "swimming tadpoles." Joan, a perceptive child, asked, "Why are they going different ways?"

Mrs. Frazee took the naturally occurring opportunity to explain the beginning and ending of quotations. Reading continued when they turned to the pocket chart where the sentence strips read:

When they passed by a ___
Very Tall Mouse would say,
"Hello, ___."
Very Short Mouse would say,
"Hello ____."

The children read these in unison, taking turns filling in the blanks (without print) before they turned back to their texts and read the story for the third time. The fourth time, they read the text as a dramatic script with Mrs. Frazee reading the narration and the children reading the quotations. Sometimes the quotes were read by all, sometimes girls only and sometimes boys only. All children were expected to participate and the pace was set to maximize involvement. The fifth reading was silent while the children followed a tape recording of the text.

With these five readings and the attention to the quotation marks as preparation, the children chose to be either short or tall--tall ones stood and short sat--for the next two readings. Mrs. Frazee again read the narration, and the children the appropriate quotations. In total, they read the text together seven times before the children engaged in dramatization, attempted independent reading, and completed a related writing task.

The Frazee and Alward programs consistently offer similar language learning opportunities in which speaking, reading, and writing are thematically coordinated. Attention given to meaningful language units is primary; attention to sound-symbol associations is secondary and always within the context of creating meaning.

Miller program. The Miller program attempts to balance traditional instruction with extended periods of reading and writing connected text. Like the Alward and Frazee programs, the Miller program provides extensive exposure to children's literature. Much time is spent with the teacher reading to the whole class and in shared (oral and choral) reading, largely of big books (predictable text). In fact, each day begins with a period (approximately 25 minutes) of teacher-led repeated readings (in unison) of thematically related poems and big books. The available basal reading program is of traditional design, a matter of some concern to Miss Miller, who attempts to balance the program by choosing only the reading selections and workbook exercises she feels are instructive. Time is made available daily for writing. During this time, Miss Miller offers praise and encouragement as she circulates among the

young authors. Their requests for assistance (usually regarding spelling) are responded to with the directive to "put down what you think." After a period of writing (approximately 20 minutes) volunteers are asked to share their writing. There are usually more volunteers than time permits for individual sharing. Comments by Miss Miller after each child reads are of a complimentary, general nature.

Representative writing instruction followed Miss Miller's reading of Ezra Jack Keats's (1962), *The Snowy Day*. She sketched a large umbrella on the top of the chalkboard and three smaller umbrellas under it. She explained to the children that the first sentence of a paragraph must tell what they are talking about, the next two sentences must tell at least two details, and the final sentence should be "almost like the first one only a little bit different." The children were then asked to apply this pattern to write snow stories.

Prior to writing independently, as a group they composed a model on the chalkboard with Miss Miller acting as scribe. The first volunteer, Victoria, suggested, "I love snow," as the topic sentence. Miss Miller wrote in the large umbrella, saying each word as she wrote.

Matthew added, "My dog likes snow, too."

Miss Miller wrote in the first small umbrella, "I like to play in the snow with my dog." As she wrote she asked, "What kind of an *i* should I use for the word *I*?" As they continued, Miss Miller prompted for adjectives and punctuation. Together they produced a paragraph that demonstrated the intended framework. Independent writing, an almost daily occurrence, followed.

This classroom program is best characterized by the words opportunity and encouragement: time is dedicated to reading and writing, a large collection of tradebooks and a variety of writing materials are always available, and teacher praise, but not direct instruction, is abundant.

Scott program. The Scott program is based on a traditional basal reading program, but is supplemented with daily reading of big books and opportunities for independent writing using invented spelling. Time is provided on an irregular schedule for independent and partner reading of tradebooks.

Each day in this classroom, as in Miss Miller's, begins with the class gathered on the floor as a group reading stories from big books or poems from hand-written charts. During theses readings, the children chant along with or slightly echo Miss Scott as she reads. She directs their attention to the print by underlining the text with her pointer; sometimes she stops or goes back to specific words or orthographic patterns she wants to make explicit. All texts are read more than twice, often over a period of two or three days. For many, but not all of the big books, small copies are available. From time to time children voluntarily read these either independently or with a partner.

As part of her presentation of the basal reading program to the focal children, Miss Scott addresses many features of printed language in structured phonics and writing lessons, many of which utilize workbooks and supplementary (duplicated) exercises. One lesson to the whole class drew attention to the use of capital letters.

With the children seated at their desks and facing the front chalkboard Miss Scott asked, "When are we supposed to use capital letters?" When no one responded she added, "I can think of one of today's spelling words that needs a capital."

With this added clue, the children chorally replied, "I." She wrote *I* as rule number one and continued to elicit and record two more rules: names and the first word in a sentence.

With this list in view she distributed duplicated booklets of worksheets. The first one required the children to insert capital letters in five sentences. Individual children (none of the focal children) read each sentence and suggested where capital letters should be used. All children circled on their pages where capital letters were needed as the reading of each sentence proceeded. When all five sentences had been read, the children independently rewrote each sentence, inserting the appropriate capital letters. In contrast to this explicit instruction, their next task was to write an entry in their journals--selecting a topic of personal interest--using invented spelling.

Briefly, this classroom program is eclectic. It borrows from direct and sometimes isolated phonics instruction together with much teacher direction of reading and writing experience. At the same time, it includes activities such as repeated readings of predictable texts and writing using invented spelling, learning activities more closely aligned with contemporary holistic instruction.

In summary, although the four classroom teachers hold the common expectation that all children will learn to read and write independently, the learning environments provided to support that language development are quite different. They span the continuum of instruction from an emphasis on teacher-as-facilitator of learning to a much higher degree of teacher control. They have in common, albeit to different extents, exposure to children's literature, repeated unison readings of predictable texts, and writing using invented spelling.

Outcomes

Individual assessments. The data describing individual performances were examined from two perspectives, four groups and individual children. Group performance on all measures of phonemic awareness, reading, and writing is shown in Table 1. T-tests for dependent means indicated that between October and April gains at the $p = .0001$ level of significance were made on all tests except deletion, on which significance was reached at the $p = .003$ level.

[Insert Table 1 about here.]

To look at the relations between measures of phonemic awareness and academic achievement, Pearson Product Moment Correlations were calculated. Of primary interest are the correlations shown in Table 2 of each October measure of phonemic awareness (including invented spelling) with the ultimate goal of reading connected text in April.

[Insert Table 2 about here.]

As in previous research (Mann et al., 1987; Zifcak, 1981), an early measure of invented spelling was the highest correlate of both word recognition ($r = .75$) and text reading ($r = .71$). Further, October invented spelling significantly correlated with writing vocabulary (the number of words children wrote correctly) ($r = .45$) and sentence dictation ($r = .55$) in April. In other words, children's ability to segment a dictated word and to match letters to those segments, as invented spelling requires, is a moderately strong correlate of several indices of reading and writing ability upon completion of one school year in a holistic language arts program.

One-way analysis of variance (ANOVA) indicated differences among groups on October performances on alphabet, $F(3, 16) = 7.57, p = .002$; invented spelling, $F(3,16) = 5.34, p = .009$; and word recognition, $F(3,16) = 4.82, p = .01$. Tukey's (HSD) post hoc comparisons ($p = .05$) indicated the Alward group differed significantly from the other three, none of which differed from each other: the Alward children named fewer letters, spelled less accurately, and read fewer words.

Analysis of covariance (ANCOVA) in which October alphabet, invented spelling, and word recognition scores were entered as a block of covariates revealed significant differences on May measures of invented spelling, sentence dictation, and phonemic awareness. Tukey's (HSD) post hoc comparisons ($p = .05$) revealed that Frazee children were significantly superior to the Scott children, but that the Frazee, Alward, and Miller children did not differ significantly from each other on measures of invented spelling and sentence dictation. Post hoc comparisons of the TALS indicate the Frazee children were superior to the Miller and Scott children, but that the Frazee and Alward children did not differ from each other on the phonemic awareness tests that comprised the TALS. We speculate that the more extensive writing opportunities and experience with reading connected text of the Alward, Frazee, and Miller children account, in part, for the differences in performance.

To examine the emerging relationship between phonemic awareness and reading achievement, we categorized the children on the basis of their degree of phonemic awareness in October and April and their level of reading achievement in April. For the purposes of this categorization, "adequate" phonemic awareness was defined as achieving a score of 5 or more (possible 10) on measures of blending, segmenting, and deletion; a score of 18 or more (possible 36) on the TALS; and 50 or more (possible 100) on invented spelling. Children who did not meet these criteria were considered to have "poor" phonemic awareness; Those who did were classified as possessing adequate phonemic awareness. Grade level reading was defined as Level 11, the conventional third preprimer level. Children who were reading at Level 10 or lower were classified as not reading at grade level: Those at level 11 or higher were classified as reading at grade level. Tables 3 and 4 summarize the relationships between phonemic awareness and reading achievement.

[Insert Tables 3 and 4 about here.]

Notice that of the 11 readers who reached grade level, only three possessed adequate phonemic awareness in October, but all possessed it by April. Further note that of the below-grade- level readers, one had adequate phonemic awareness in October, but by April 8 out of 9 had achieved adequate status. Consistent with previous research (Tunmer & Nesdale, 1985) the performance of these children suggests that phonemic awareness is a necessary, but not sufficient condition for reading success. Further, as a group, their gains support the hypothesis that holistic instruction that includes writing using invented spelling and repeated readings of predictable text contributes to phonemic awareness development.

Teacher interviews. Interviews and periodic discussions with teachers revealed somewhat differing theoretical orientations, but a common lack of differentiation between phonemic awareness and phonics. When the difference was explained during final interviews, Mrs. Alward and Mrs. Frazee quickly suggested that they believed the extensive writing component of their programs could directly influence phonemic awareness development.

Final interviews also confirmed that the instruction observed over the year varied directly with theoretical orientation. That is, Mrs. Alward, Mrs. Frazee, and Miss Miller held the belief that children learned to read and write through engagement in the processes of reading and writing. In some contrast, Miss Scott contended during the final interview that direct instruction of some language structures, including phonics, was necessary before, during, and after a child's engagement in reading and writing. In the case of Miss Scott, the initial interview had been somewhat misleading. Later probing of her theoretical orientation using examples of observed instruction made it clear that verbalization, belief, and practice were sometimes at odds.

Children's interviews. The children were more than willing to share their understanding of, and enthusiasm for the processes of reading and writing. Bearing in mind that these were children for whom reading was a greater than usual challenge, we found it striking that they all quickly stated that they liked to read and only two hesitated momentarily to classify themselves as good readers. Their

perceptions of the process demands for successful reading appeared to be similar, despite the observed differences in instructional practices and theoretical orientations of their programs.

Children from all groups indicated that they attended to two levels of text: phoneme-grapheme associations and whole words. For example, Jeremy (from Mrs. Alward's class) observed when asked if readers needed to know all letter-sound associations, "Not like *x*, *y*, or *z*, unless, of course, you got *extra*, or *Ramirez*, or *yikes*." With similar understanding, Linda (from Mrs. Frazee's class) told us, "Sometimes you need to know letter sounds and sometimes you don't. If you know the word you don't, and if you don't, you do, so you can do this [sound it out]."

Their second perceived key to reading success was knowing even the "hard" words. Presumably by working through the process, at least some have gained accurate insight into and metacognitive awareness of the demands of reading and writing. It appears that they, somewhat intuitively, have sensed a need for mastery over the alphabetic principles of their language in order to gain reading proficiency.

Parent questionnaires. In light of abundant literature indicating the supportive influence of home literacy experiences on early reading achievement (Mason & McCormick, 1989; Teale, 1986), we asked the parents of our focal children to describe their children's preschool and current out-of-school experiences with reading and writing to help complete the picture of phonemic awareness development.

Data were available for all but one focal child. We recognize that the reliability of these data is dependent upon the accuracy with which parents were able to recall their child's preschool behavior and the accuracy with which they reported present literacy activities in their homes.

The descriptions parents provided indicated striking overall similarities, but some differences in home literacy experiences did exist. In general, children's literacy experiences outside of school while attending first grade and during the preschool years were differentiated by frequency rather than type of activity.

As the children progressed through the preschool years of ages 2 through 4, all were engaged in more language activities than during their first two years. Children in Miss Miller's and Miss Scott's classrooms however, were strikingly less involved between ages 2 and 4 than the children in the other two classes. Most notably, Miss Miller's and Miss Scott's children rarely engaged in listening to tape-recorded stories or in attempting to write words or letters. Also, although they were read to by an adult, the frequency with which this happened was less than the every day experience of the children in Mrs. Alward's and Mrs. Frazee's classrooms.

Although children in all four groups experienced a variety of preschool language activities including being read to, watching *Sesame Street*, and attempting to write, the frequency of being read to was notably greater for children in Mrs. Alward's and Mrs. Frazee's classrooms. We think it is more than coincidental that these children were also the more proficient readers at the end of first grade.

Profiles of Individual Children

Within the total group of focal children, several subgroups emerge: groups of grade-level and below-grade-level readers, groups who experienced extensive and less extensive home literacy, and groups who wrote competently and less competently using invented spelling. Further, there also appear divergent patterns of individual performance. To bring these patterns and their associations with instruction and home literacy into closer focus, profiles of four children were assembled. They are presented in pairs to highlight contrasts and similarities.

Lynn and Charlotte. Lynn and Charlotte began first grade with the expectation that they would learn to read, Lynn with Mrs. Alward and Charlotte with Miss Scott. Both completed their year with feelings of accomplishment and were promoted.

Their literacy experiences at home as preschoolers, kindergartners, and during first grade differed in several ways, but both girls had preschool experience with books, Lynn much more than Charlotte. Outside of school (in first grade), Lynn sometimes played with language by making up nonsense and rhyming words, and she read and wrote daily either independently or with adult assistance. Charlotte's first-grade experience with print outside the classroom was, in contrast, focused on daily reading in which she took turns with an adult or sometimes was read to by an adult. In further contrast to Lynn, Charlotte had opportunity to see an adult reading less than once per week. The proportion of literacy activities in which they engaged and the mean proportion of their classes is shown in Table 5.

[Insert Table 5 about here.]

On individual assessments of phonemic awareness, reading, and writing in October, the girls appeared to have similar language facility to bring to bear upon the task of learning to read. Their performance on all tests is summarized in Table 6.

[Insert Table 6 about here.]

Given their parallel performances in October, particularly on the invented spelling tasks, similar outcomes in April might be expected. The girls experienced different instructional programs and contrasting home literacy. In brief, Lynn was in Mrs. Alward's program; she worked consistently from day to day; read frequently by herself, with partners, and in choral groups; she wrote extensively; and she received contextualized letter-sound instruction. In addition, her small- group assistance was closely linked to the classroom program.

Charlotte's program with Miss Scott also provided the repeated choral readings of whole texts, mostly big books and poetry, but otherwise provided little time for reading connected text. Writing was attempted less frequently and when it was attempted, the lessons were based on skill mastery rather than a process approach. Letter-sound associations were introduced and reinforced both in the context of the repeated readings and in a skill and drill approach. Finally, the instruction Charlotte received outside the classroom in the Chapter 1, speech, and learning disabilities programs was not planfully linked to her classroom instruction. For example, the context cue word recognition strategy presented in one observed learning disabilities lesson could not be easily transferred to the classroom assignment later that day to read loosely sequenced text based upon similar phonograms.

To what can the differences in performance be attributed? Three possibilities seem plausible. First, it is possible that differences in instructional programs directly affected achievement. Second, the contrasts in home literacy may have made the difference. Third, it is possible that Lynn and Charlotte possess different learning capabilities. The most likely explanation, however, is that all three factors contributed to the reading and writing gains made by both girls.

Linda and Danny. In comparing Lynn and Charlotte, we were able to examine the possibility that differences in instruction might influence literacy development. By comparing Linda and Danny, we can examine the variability in reading achievement within a single program. Like Lynn and Charlotte, Linda and Danny held the expectation in October that they would learn to read: Linda with Mrs. Frazee and Danny with Mrs. Alward. In April, both children felt that they were good readers.

As preschoolers, both had opportunities to engage in early literacy activities in families where books and writing materials were available. While in first grade, Linda spent time at home playing school, writing notes, and reading both independently and with an adult. Danny's parents read to him, but he did not

choose to read at home. The proportion of their home literacy tasks is shown in comparison to that of their classes in Table 7.

[Insert Table 7 about here.]

Although in many ways similar, Linda and Danny are clearly distinguished from each other on their initial measures of invented spelling and writing vocabulary and their April measures of text reading. Their complete assessment performance is shown in Table 8. Linda's invented spelling in October (57%) resembled that of other children who became successful readers, and she too, read comprehensively at the first-grade level in April. Danny, in sharp contrast, scored poorly (25%) on invented spelling in October and succeeded in reading only at the first preprimer level in April.

[Insert Table 8 about here.]

To what can the differences in Linda and Danny's reading achievement be attributed? First, the October difference in invented spelling, given its relationship to reading success, is one explanatory candidate. Second, although the instruction provided for Linda and Danny was similar, the two children were repeatedly observed to respond differently to their school learning opportunities. While Linda usually appeared attentive and engaged with tasks, particularly writing, Danny was easily distracted and frequently had difficulty getting assignments started, often turning to his peers or Mrs. Alward for assistance to complete tasks. Finally, Linda, but not Danny, complemented her classroom experience with reading and writing at home, both by herself and with an adult.

Some commonalities in the profiles of Lynn and Linda account for their success. First, both girls began with facility in invented spelling and both were able (in October) to segment sentences into words and to make at least onset-rime divisions when they attempted phonemic segmentation. Second, both were read to and attempted some writing as preschoolers. Third, both read and wrote with adults at home while in first grade. Finally, both were engaged in holistic programs of language arts instruction where they spent extended periods of time writing using invented spelling, participated in choral repeated readings of texts, reading independently and with partners on a daily basis, and where their teachers focused their attention on letter-sound associations both in context and sometimes more explicitly in short periods of spelling instruction. These four factors, invented spelling, segmentation, home literacy, and holistic language arts instruction, appear to be linked to reading success.

CONCLUSIONS

From our observations and performance records, we are able to draw four conclusions. First, children who are at risk for failure to read and write and who are engaged in holistic language arts programs improve their performance on tasks of phonemic awareness. The instructional practices that appear to contribute to this change in phonemic awareness are writing using invented spelling and reading connected text both in unison and independently. The importance of having both the facility and the opportunity to write invented spelling cannot be overestimated; the ability to encode the phonological properties of words in letters is the strongest correlate of word recognition and text reading upon completion of one year of holistic language arts instruction. This is consistent with previous research (Liberman et al.,1985; Zifcak, 1981) for children in other types of instructional programs.

A second conclusion reaffirms past research. Phonemic awareness is a necessary but not sufficient condition for reading and writing success. One child who demonstrated competency on tasks of phonemic awareness in October failed to reach grade-level reading in April; several who began the year with little phonemic awareness, but who by April had gained competency in phonemic awareness, failed to read successfully at grade level. Conversely, most who began the year with adequate phonemic awareness, or who gained it by April, became successful readers.

A third conclusion, which follows from the first and second, concerns the benefit of holistic language arts instruction, particularly the practice of using invented spelling and the choral and independent reading of predictable texts provided in these programs. Although holistic language arts instruction contributes to phonemic awareness, it does not guarantee reading success for all children. This implies that instruction other than that typically provided may be needed for some children to be successful readers.

The final conclusion concerns the influences on phonemic awareness that originate outside the classroom. The contribution of home literacy to the development of phonemic awareness is apparent. Children who participated in literacy activities as preschoolers and who continued to have experiences with print outside of school tended to achieve grade level reading and writing competencies.

Although from this study it is not possible to clearly separate classroom and home influences, the reading and writing success of many of the children at risk for failure bodes well for holistic language arts instruction. Previous studies (Morais, 1987a; Perfetti et al., 1987; Tunmer & Nesdale, 1985) established that children engaged in phonics-based, whole-word, and basal reading programs made gains in phonemic awareness. This study now extends the list of approaches that contribute to phonemic awareness to include holistic language arts programs.

In view of the increasing popularity of whole language programs that, like those observed in this study, offer no explicit phonemic awareness training and little explicit sound-symbol association instruction, this study is both supportive and cautionary. It demonstrates that children develop phonemic awareness as a part of everyday, natural literacy activities, but warns that the reading and writing experiences of holistic language arts programs are not alone sufficient for some children to be successful in learning to read. One plausible interpretation of this is that for those children, different or supplementary instruction is necessary. It is also possible that the lack of universal success of holistic programs can be attributed to lack of compatibility of instruction with the preschool experiences of these children. Further research concerning the interrelationship of specific preschool experiences, phonemic awareness development, and holistic instruction is required if we are to fully understand the reasons for lack of success.

Existing research describes successful instruction largely as an entity separate from reading and writing connected text. The need at this time is for research to determine the design of effective phonemic awareness instruction that is compatible with the goals of holistic or whole language programs. Phonemic awareness instruction must be seen to contribute directly to meaning construction.

The relationship between literacy and phonemic awareness is complex. Clearly, these skilled behaviors have a symbiotic relationship. In the future, it would be useful to determine the essential direction of that symbiosis and to design effective instruction accordingly.

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Author Note

The work upon which this publication was based was supported in part by the Office of Educational Research and Improvement under Cooperative Agreement No. G0087-C1001-90 with the Center for the Study of Reading, and in part by a dissertation support grant from the College of Education at the University of Illinois.

Table 1

Class Means and Standard Deviations for All Tests in October and April

Measures		Total Possible	Classes							
			Alward M (SD)		Frazee M (SD)		Miller M (SD)		Scott M (SD)	
Blend	October	10	5.20	(3.27)	6.00	(3.16)	9.00	(1.22)	6.40	(2.50)
	April	10	9.00	(1.73)	9.20	(1.09)	9.60	(0.54)	9.60	(0.54)
Segment	October	10	3.80	(2.49)	4.00	(1.58)	5.20	(1.48)	4.60	(3.36)
	April	10	8.80	(1.78)	7.80	(1.09)	8.00	(1.41)	7.00	(1.58)
Delete	October	10	6.40	(3.85)	7.00	(2.23)	5.20	(1.48)	3.80	(3.56)
	April	10	8.60	(1.67)	9.60	(0.54)	8.60	(1.34)	5.40	(3.28)
TALS	October	36	14.00	(4.00)	16.20	(2.86)	18.80	(2.95)	14.20	(6.91)
	April	36	26.40	(2.61)	29.80	(2.94)	25.40	(1.51)	25.00	(2.12)
Inv.Spel	October	100	42.20	(15.12)	56.60	(6.84)	64.80	(5.76)	48.60	(7.16)
	April	100	78.80	(10.82)	84.00	(5.39)	80.20	(6.80)	69.20	(2.95)
Writ.Voc*	October		9.00	(4.36)	16.00	(6.89)	13.60	(5.94)	7.60	(2.07)
	April		33.20	(12.43)	47.60	(11.84)	39.80	(16.30)	22.60	(7.16)
Sen.Dict.	October	37	16.80	(11.05)	19.80	(6.98)	23.00	(1.87)	14.40	(4.15)
	April	37	33.80	(4.15)	36.40	(0.89)	34.20	(2.16)	31.20	(2.68)
Alphabet	October	54	48.40	(3.64)	53.00	(1.22)	53.60	(0.54)	53.20	(0.83)
	April	54	54.00	(0.00)	54.00	(0.00)	54.00	(0.00)	54.00	(0.00)
Word Rec.	October	35	8.40	(4.39)	12.20	(2.77)	15.40	(2.70)	9.80	(2.16)
	April	35	17.40	(5.58)	23.00	(2.92)	23.60	(6.80)	19.60	(1.95)
Text Level	October	18	0.60	(1.34)	2.40	(1.82)	2.20	(2.38)	0.00	(0.00)
	April	18	7.80	(5.76)	12.60	(2.19)	12.20	(3.42)	7.80	(2.68)

*No maximum, individual performance in 10-minute time period.

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Table 2

Correlations Between October and April Measures of Phonemic Awareness, Reading and Writing

	April									
October	Blend	Seg	Del	TALS	In. Sp.	Wr. Voc.	Sen. Dic.	Alpha[a]	Word Rec.	Text
1. Blend	.54	.10	.18	.19	.28	.21	.27		.54	.42
2. Seg	.36	.14	.04	.05	.20	.14	.23		.27	.19
3. Del	.01	-.09	.32	.47	.30	.22	.29		.22	.39
4. TALS	.41	.44	.44	.35	.50	.54	.53		.49	.47
5. In.Sp.	.34	.06	.17	.26	.55	.45	.55		.75	.71
6. Wr.Voc.	.08	.03	.44	.54	.55	.68	.47		.48	.57
7. Sen.Dic.	.46	.22	.48	.55	.63	.46	.62		.73	.72
8. Alpha	.46	-.06	-.03	.20	.08	.09	.21		.49	.38
9. Word Rec.	.09	.03	.21	.17	.34	.18	.36		.48	.59
10.Text	.13	-.08	.44	.52	.56	.54	.46		.67	.67

Note. With $n = 20$, $r = .44$ is significantly different from 0.0 at $p = .05$.

[a] No variance in April measure (all students received perfect scores).

Table 3

Relationship of October Phonemic Awareness to April Reading Level

		October Phonemic Awareness	
		Adequate	Poor
April Reading	Grade Level	3	8
	Below Grade Level	1	8

Table 4

Relationship of April Phonemic Awareness to April Reading Level

		April Phonemic Awareness	
		Adequate	Poor
April Reading	Grade Level	11	
	Below Grade Level	8	1

Table 5

Proportion of Home Literacy Activities Engaged in by Lynn, Charlotte, and Their Groups

Age Category	Lynn	Group	Charlotte	Group
Age 0-2	.55	.69	.36	.64
Age 2-4	.93	.87	.53	.68
Age 4-School	.86	.73	.68	.81
Present (child)	1.00	.63	.33	.63
Present (child with adult)	1.00	.63	.50	.69
Total	.84	.73	.53	.71

Table 6

Individual Assessment Results for Lynn and Charlotte

	Lynn		Charlotte	
Tests	October	April	October	April
Blending (10)	4	10	6	9
Segment (10)	6	10	6	5
Deletion (10)	8	10	7	6
TALS (36)	16	28	9	25
Invent. Spell (100)	56	91	54	68
Writ. Vocab.	8	50	8	27
Sent. Dictation (37)	23	37	18	33
Alphabet (54)	46	54	54	54
Word Recog. (35)	6	25	11	18
Text (18)	0	15	0	5

Table 7

Proportion of Home Literacy Activities Engaged in by Linda, Danny, and Their Groups

Age Category	Danny	Group	Linda	Group
Age 0-2	.64	.69	.73	.85
Age 2-4	.67	.87	.80	.93
Age 4-School	.68	.73	.86	.80
Present (child)	.50	.63	.67	.77
Present (child with adult)	.63	.63	1.00	.88
Total	.65	.73	.82	.85

Table 8

Individual Assessment Results for Linda and Danny

	Danny		Linda	
Tests	October	April	October	April
Blending (10)	1	6	1	8
Segment (10)	0	6	3	8
Deletion (10)	6	8	4	9
TALS (36)	11	24	18	27
Invent. Spell (100)	25	65	57	87
Writ. Vocab.	6	22	21	52
Sent. Dictation (37)	7	27	10	37
Alphabet (54)	45	54	51	54
Word Recog. (35)	8	12	11	21
Text (18)	0	3	1	12

APPENDIX A

SELECTION CRITERIA FOR CLASSROOMS AND FOCAL CHILDREN

Holistic Language Arts Classrooms

The descriptors to aid classroom identification have been divided into two categories: essential and nonessential, but desirable.

Essential Characteristics

- language development is the primary goal of the program (stated by teacher)
- books have a prominent place in the classroom
- extensive supply of easy reading, patterned and predictable books available in classroom
- time is allotted daily for individual reading of connected text by every child (beginning of the year this may mean picture reading for some children)
- basal reading program is not the only source of reading instruction material, but could employ a basal as one source of instructional material
- use workbook accompanying basal judiciously if at all
- allot time for writing daily and involve children in the writing process from the beginning of the school year
- encourage and accept invented spelling in beginning writing
- provide encouragement and daily opportunities for oral language development
- provide daily opportunities for the development of listening skills
- assessment of learning is at least partially based upon individual progress as seen in samples of daily work collected over time
- assessment information is used to plan future instruction
- letter-sound associations are presented as a means of decoding and not in isolation as an end in themselves
- word recognition is presented as a problem to be solved in a number of ways pending the structure and predictability of the word
- teacher reads to the children at least once daily

Desirable Characteristics

- instruction based on needs demonstrated by individual students or groups of students
- library book exchange at least once weekly and may or may not have instruction in library skills
- journal writing with response from teacher or other adult or older student

- writing used as way of learning in content area lessons (probably group charts at the beginning of the year and later individual writing) to record newly acquired information and discussion.

- Big books used for group reading in a way similar to shared book experience as described by Holdaway (1979)

- daily responses to literature in writing and creative arts . . . music, drama, graphic arts

- listening centers available to present whole selections to nonreaders

- some student choice allowed in determination of tasks and materials

Focal Children

Preliminary observations and teacher judgement were used to guide selection. Teachers were asked to identify five children for whom they had concerns regarding the certainty of their becoming readers and writers as expected during the year. Children were excluded as candidates for observation if they were:

- repeaters (could have repeated kindergarten or a transition class prior to grade one)

- receiving speech therapy

- receiving remedial instruction from either LD or Chapter 1 programs at the outset of the year

- sensory-impaired (particularly hearing requiring aids)

- not native speakers of English

- reportedly sporadic in their school attendance

APPENDIX B

TEST BATTERY FOR ASSESSMENT OF PHONEMIC AWARENESS, READING, AND WRITING

TEST BATTERY FOR ASSESSMENT OF PHONEMIC AWARENESS, READING, AND WRITING

This appendix contains a description of the 10 tests that comprise the individual assessments. The tests are designed to measure phonemic awareness and reading ability. The description of each test includes the rationale for its inclusion, the nature of the task, the materials required, the test items when appropriate, the procedures followed, and the directions for scoring the test. The purpose of this appendix is to provide sufficient description of the test battery to permit replication.

General Directions for All Tests

All tests are individually administered. Although no special qualifications are required, the examiner should be familiar with standardized assessment procedures and should be sensitive to signs of fatigue and frustration in young children. Children should be comfortable and at ease throughout the assessment.

The test battery should be administered in two 30-minute sessions. Only the Writing Vocabulary test is timed. For all other tests, children should be given the time they require for completion. Testing should be conducted in a quiet area, free from auditory and visual distractions. The examiner should record all responses as they are given by the children.

Test 1: Letter Name Knowledge

Rationale. Two research findings suggest that a test of letter-name knowledge should be included in an investigation of the development phonemic awareness in beginning readers. First, letter-name knowledge is a reliable predictor of reading success (Durrell, 1958; Samuels, 1972). Second, phonemic awareness training using letter markers is more effective than training using unmarked markers (Hohn & Ehri, 1983).

Description. This task requires the child to provide the names of the 26 letters of the alphabet in upper and lower case as they appear in the test of Letter Identification in the Diagnostic Survey (Clay, 1985). Alternate formations of the letters *a* and *g* are included, making a total of 54 letters to be identified.

Materials.

Printed letter stimulus (Diagnostic Survey)
Response record

Procedure. Note that these instructions differ from those suggested by Clay (1985). The intent is to measure the child's knowledge of letter names.

With the child seated opposite the examiner, place the stimulus page in front of the child. Ask the child to provide the letter names. Say: *Tell me the name of each letter. Start here* (point to the letter A) *and go across each row. If you are not sure, it is all right to guess.* If the child skips a letter, simply point to it and ask for the letter name.

There is no time limit. If a child is unsure of a letter name, encourage a guess. If no response is offered, provide verbal reassurance and direct the child to continue. Note that it is *letter names* that are sought. On the response record, indicate correct responses with a check mark and write the response given if incorrect.

Scoring. Score 1 point for each correct letter name. The total possible points is 54.

Test 2: Blending

Rationale. A test of phoneme blending is included because it has been repeatedly demonstrated that ability to blend phonemes is both a necessity for accurate decoding and a reliable predictor of reading ability (Perfetti et al., 1987). The test task is a modification of that presented by Lundberg, Frost, and Petersen (1988) to measure syllable segmentation. The segmentation of phonemes has been substituted for segmentation of syllables for three reasons: skill in phonemic analysis is more difficult and later developing (than . . .)? (Yopp, 1988; Zifcak, 1981), phoneme segmentation is highly correlated with reading ability (Lundberg, Olofsson, & Wall, 1980; Mann, 1984), and the purpose of the test is to gain insight into the children's processing of the language at the phoneme level.

Description. This task requires the child to synthesize and to pronounce the word formed by the synthesis of experimenter-presented phonemes. The 10 words presented contain two, three, or four phonemes and are presented in random order with respect to the number of phonemes. To ensure that the range of difficulty presented in natural language, is spanned the words included contain both stop and continuant consonants, as well as digraphs and blends. The child is given immediate confirmation or correction of responses by looking at picture cards.

Materials.

Fourteen 3" x 5" index cards each containing a simple picture of one of the following: boat, bed, shoe, run, soap, boy, lamp, mice, key, queen, brush, watch, money, and flower.

Response sheet.

Procedure.

Demonstration:	boat									
Practice:	bed	shoe	run							
Test items:	soap	boy	lamp	flower	mice	key	queen	brush	watch	money

Seat the child opposite the examiner at a small table. Place the picture cards, turned face down, on the table in front of the child. To facilitate having the child turn over only one card at a time, place the cards in a single row in the order of presentation from the child's left to right. Explain the task requirements by demonstrating, using the word *boat*. Say: *I am going to say a word in parts. Listen carefully as I say the parts of a word. When I am finished I want you to tell me what word it would be if I put all the parts together. After you tell me, you may turn the card over and check.* Leaving a one-second pause between phonemes continue: /b/ /o/ /t/. *My word is boat. You may turn the card over to check.*

After the child checks the response continue: *This time it will be your turn to tell me the word. Listen as I say another word.* Proceed to the three practice items. The child may spontaneously repeat the experimenter's utterance. Do not encourage or prohibit this. If the child is unsuccessful on practice items, repeat the procedure asking for another response before allowing the student to turn over the picture card. If the child is unsuccessful after two attempts, turn the card over and proceed to the next item.

Before presenting the test items remind the child that you will not repeat the phonemes. Say: *Listen carefully. I will say each word part only one time.* If the child's response pronunciation is doubtful, clarify confusions by asking the child to use the word in a sentence before turning over the picture card. If incorrect, simply move on quickly to the next item saying: *Let's try another one.* Proceed until all test items have been presented.
Record the child's responses with a check mark for correct responses and the response given for incorrect responses.

Scoring. Score one point for each correct response. The total possible is 10 points.

Test 3: Segmentation

Rationale. Ability to segment words into phonemes has been repeatedly demonstrated as both a prerequisite of learning to read and a reliable predictor of reading achievement (Liberman, Shankweiler, Fischer, & Carter, 1974; Tunmer & Nesdale, 1985). The test task is based on the work of Elkonin (1963, 1973), who recommended concretely representing phoneme segments. Markers are used to lessen the memory demands for phoneme counting. Unlettered markers (pennies) are used to avoid any possible confusion that letter introduction might cause.

Both continuant and stop consonants are included to simulate the processing demands of natural language. Determined after review of previously reported successful assessment and informal task trials with first-grade children. The number of phonemes in each word is two, three, or four.

Description. This is a game-like task in which the child is to segment, pronounce, and count the phonemes in the names of small, plastic toy animals. The child is asked to imagine that a troll living under the bridge requires each animal to pay one penny for each phoneme in his name before crossing the bridge. The test task is similar to that reported by Zhurova (1963). It differs however, in that segmentation and pronunciation of all phonemes in each word is required in contrast to splitting off only the initial phoneme as Zhurova asked.

Materials.

Plastic or cardboard bridge
Toy animals: dog, cat, ox, pig, cow, goat, fish, ape, mouse, pony, duck, bear, sheep, tiger.
Pennies (at least 45)
Dish (for penny collection)

Procedure.

Demonstration:	dog									
Practice items:	cat		bee		pig					
Test items:	cow	goat		fish	ape	mouse	pony	duck	bear	sheep	tiger

Seat the child opposite the examiner at a small table. The child should be able to easily manipulate objects on top of the table. Place the bridge in the center of the table. To the child's left place the toy animals (in the order of presentation) and the collection of pennies. Place the dish in which the pennies are to be deposited to the right of the bridge. Say: *The animals want to cross the bridge. The ugly troll who lives under the bridge makes them pay to go across. They must pay one penny for each sound in their names. Watch and listen. I will show how to help the animals get across.*

Demonstrate the procedure. Pick up the dog and place it on the left side of the bridge as if ready to cross. Say: *dog, /d/.* Pick up one penny from the collection. Say: */o/.* Pick up a second penny. Say: */g/.* Pick up a third penny. Hold out your hand so all pennies are visible to the child and count the pennies. Say: *a dog pays three.* Deposit the pennies in the dish on the far side of the bridge and push the dog across the bridge.

Continue with the three practice items. Have the child name each animal before attempting segmentation. If a name is not known or an error is made, tell the child the label being used for this test.

During presentation of practice items, if a segmentation error is made ask the child to repeat the process. If the child's second attempt is not accurate, demonstrate the correct response and let the child move the animal across the bridge. If the child is correct say: *Now the [animal] may go across.* If the child segments correctly and puts out one penny for each segment, but counts the pennies inaccurately, help to recount and consider the item correct.

During presentation of the test items, do not provide feedback in respect to either segments or response accuracy. After pronunciation and deposit of the pennies, simply say: *Now the [animal] may go across.*

Record the child's segmented pronunciation and the number of phonemes counted on the record sheet. Note any assistance given with practice items.

Scoring. Count one point for each word that is correctly pronounced in phoneme segments and for which the number of segments is indicated correctly.

If a child *pronounces incorrectly*, but represents with pennies accurately, do not credit the item. For example, *fish* pronounced as /fi/ /sh/ and represented by three pennies and *sheep* pronounced as /she/ /ee/ /p/ and represented as three are incorrect. The segmentation must be accurate to be scored as correct. If the segmentation is correct and the correct number of pennies is presented, but the child says the wrong number, simply count the pennies with the child and count the item as correct. This is not a test of counting ability. Some allowance must be made for the unavoidable addition of a schwa to pronunciation of consonant phonemes, but when it results in the definite addition of a phoneme it should be considered inaccurate. No partial scores are given. The total number of points possible is 10.

Test 4: Sawyer's Test of Awareness of Language Segments (TALS) (1987) Aspen Publishers, Rockville, MD.

Rationale. A strong relationship has been shown between reading achievement and ability to segment spoken language at three levels: word, syllable, and phoneme. Segmentation skill appears to be developmental in that children are able to segment sentences into words before they are able to segment words into syllables and finally syllables into phonemes (Ehri, 1979; Liberman et al., 1974). The TALS assesses each of these levels of segmentation. In addition, segmentation has been shown as a reliable predictor of reading achievement and to be significantly correlated with other reliable measures of language processing (both analysis and synthesis), reading readiness, and reading achievement (Juel et al, 1986; Stanovich, 1986).

Description. The TALS is an individually administered test of language processing that is designed to assess ability of children approximately ages 4 through 7 to segment the stream of spoken language at the word, syllable, and phoneme levels. It consists of three subtests: sentences-to-words, words-to-syllables, and syllables-to-phonemes. The first subtest requires the child to represent the number of words in each examiner-spoken sentence with wooden blocks. The second subtest requires similar block representation of syllables in spoken words, and the third subtest requires block representation of phonemes in spoken words.

Materials.

Manual (describes test development, validation, administration and scoring)
Response record
8 wooden blocks

Procedure. Detailed administrative procedures are prescribed in the examiner's manual and should be followed as prescribed with the exception of administration of the second sentence in each pair in Part A. The instructions in the manual advise the examiner to consider segmentations of units smaller than words as correct and segments larger than single words as errors. For example, if the child divides the word *together* into segments it is considered correct, but if the child does not segment the two words *his dog* it is considered an error. Directions in the test manual direct the examiner to present the second sentence of each pair only when the first sentence is segmented incorrectly, that is, with segments larger than words. For the purposes of this study, administer the second sentence if the child makes any segmentations smaller or larger than real words. Indicate the segmentations made on the response sheet.

Administer only Part A (sentences into words) and Part C (words into phonemes).

Scoring. Score the test as prescribed in the test manual with the exception that Part A is to be scored in two ways. First score Part A as prescribed in the manual. Second score Part A counting as correct only the real word segmentations. Record both scores for Part A. The total possible points for Part A is 18 and Part C is 18. The test total, for the purposes of this study, is 36. Compute and record the total of each part and the test total for both the prescribed and study-specific scoring schemes.

Test 5: Writing Vocabulary

Rationale. Writing behavior has been demonstrated to be a good predictor of reading behavior. In addition, writing ability indicates familiarity with letters, letter formation, left to right progression, and attention to details. Writing known words therefore, is an appropriate assessment task to attain an indication of the child's processing of words as visual units.

Description. The Test of Writing Vocabulary was constructed by Robinson (cited in Clay 1985) and is included in The Diagnostic Survey designed by Clay (1985). This is an individually administered, time-limited test (10 minutes) in which children are asked to write and subsequently read all the words they know, beginning with their names. Coaching is given while the child writes in that the examiner may suggest simple words the child might know and may ask questions concerning categories of words possibly known. For example, the examiner might ask, *Do you know the word is?* or *Do you know how to write the names of any animals?*

Materials.

Response sheet
Pencil

Procedure. The procedures for administration are provided with examples in The Diagnostic Survey (Clay, 1985), and should be followed as prescribed. The 10-minute time limit should be strictly adhered to and the coaching kept consistent with the guidelines offered by Clay.

Indicate clearly on the response sheet all words the child wrote *and* read by circling those words. Leave uncircled any words the child wrote, but was unable to read.

Scoring. Score the child's performance as prescribed in The Diagnostic Survey (Clay, 1985). Score one point for each word written correctly *and* read accurately. Words written correctly, but read inaccurately are not scored. Alternate forms of words such as *book* and *books* are considered separate words.

Test 6: Deletion of Phonemes

Rationale. Ability to recognize and pronounce a phoneme deleted from a word has been shown to be highly correlated with reading achievement (Yopp, 1988). Deletion has also been shown to be more difficult relative to blending and segmentation (Lewkowicz, 1980; Yopp, 1988). Performance on a deletion task should therefore, provide a basis for prediction of reading achievement and an indication of the developmental status of phonemic awareness.

Description. This task requires recognition and pronunciation in isolation of the phoneme deleted from the initial, medial, and final position of words pronounced by the examiner. The examiner and child are engaged in imaginary play with M&M Monster, a puppet, whose pronunciation is the deleted form of the word. The child is required to tell the puppet what phoneme has been deleted. Correct responses are immediately rewarded with M & M candies. The 10-item word list consists of vocabulary familiar to young children. The number of phonemes in each word is three, four, or five. The deletions include both stop and continuant consonants in initial and final positions, stop consonants in the medial position, and one glided vowel in the final position. Test items are presented in random order in respect to the number of phonemes and the position of the deletion.

Materials.

Whimsical character puppet
M&M candies
Response record

Procedure.

Demonstration:	red	_ed
Practice:	cake	_ake
	top	to_
	water	wa_er
Test items:	jump	_ump
	giant	gian_
	lip	_ip
	buzz	bu_
	father	fath_
	mouse	_ouse
	apple	a_le
	think	_ink
	muffin	mu_in
	silly	sill_

The examiner and child should sit on opposite sides of a small table. Introduce the puppet to the child as "M&M Monster" who would like some help in learning to pronounce words correctly. Let the child handle the puppet briefly to reduce distraction during presentation of test items.

Hold the puppet and say: *I am going to say a word and then M&M Monster is going to say e same word. He has trouble saying words and he never says all the sounds in a word. He wants you to tell him what sound he leaves out. When you tell him the sound he leaves out, he will give you some M & Ms. Listen carefully. I say red, but Monster says ed. What sound did Monster leave out? You tell me the sound Monster left out, you say /r/.*

Proceed to the practice items and present each one in the same way as the demonstration item. In the case of medial deletion pause one second between pronunciation of the preceding and succeeding sound units as in *a - le* for *apple*. If the child's response is inaccurate, repeat the practice item(s). If errors persist, model the correct response(s).

If the child responds with the letter name, say: *That's the letter name. Tell me the sound.* Give the child a few candies for each correct response. Let the child eat the treat for the practice items and suggest that later treats be piled to one side for a treat when assessment is complete.

If the child is unsuccessful on all practice items, proceed to the test items, but stop testing if the child is not successful on at least one of the first three test items. Give the child some candies as reward for effort in helping the monster learn accurate pronunciation.

Record all responses. Indicate clearly (a) if the child offers the letter name, phoneme, or both and (b) if prompting for the phoneme was required.

Scoring. Score one point for each phoneme correctly supplied. Prompted phonemes are considered correct if the letter name was correctly supplied by the child and the phoneme was subsequently provided in response to the examiner's request for the missing *sound*. Letter names alone are not considered correct.

The total possible points is 10.

Test 7: Invented Spelling

Rationale. Recent research has established strong correlation between invented spelling and reading (Mann et al., 1987; Zifcak, 1981). That is, invented spelling is a reliable predictor of reading achievement. Invented spelling is an indication of both ability to segment phonemes and knowledge of phoneme-grapheme correspondences.

Description. This test requires the child to write without assistance 20 words dictated by the examiner. The word list includes 13 of the 14 words of the Mann et al., 1987 assessment. The word *bed* was eliminated from the Mann list because it did not significantly differ from the word *red* (also included) and it posed a potential scoring problem of letter reversals. An additional seven words were included to guard against a possible ceiling effect in testing first-grade children. The additional words were selected from the Thomas (1979) list of words most frequently misspelled in first grade. All words are real words judged familiar to 6-year-old children. All except *said, have*, and *they* (from the Thomas list) can be predicted on the basis of orthographic regularity.

The scoring scheme is a modified version of those presented earlier in the literature (Libermann et al., 1985; Mann et al., 1987) and is designed to record two dimensions: orthography and phonology. The score value increases with accuracy of phonological representation and orthographic proximity to standard spelling, with the highest value attributed to standard spelling.

Materials.

Wordlist
Response sheet
Pencil

Procedures.

Word List:

1. red	6. girl	11. thank you	16. color
2. name	7. angry	12. people	17. because
3. lady	8. said	13. dog	18. they
4. fish	9. have	14. boy	19. goes
5. men	10. men	15. boat	20. went

Seat the child comfortably for writing so the examiner has a clear view of the response sheet while the child is writing. Give the child a response sheet and pencil. Say: *I want you to write each word I say. Write each word the best way you can. You might not know all the letters, but try to write what you know of each word.* Dictate each word; use the word in a simple sentence; and repeat the word. For example say: *red; The stop light is red; red.* Encourage some response for each word. Do not segment the word for the child and do not suggest that the child write "the first sound." If the child is not attempting to write the word, prompt with such phrases as, *show me what you know of the word or write what you know.* If necessary to get a response, or if the child asks what word to write, repeat the word. Caution: if children are unfamiliar with writing from dictation, being given a sentence may initially cause some confusion in identifying the target word.

There is no time limit. Do not dictate the next word until the child indicates that writing of the current item is complete. Permit reasonable erasures and changes at the time of writing each word. If the child has particular difficulty and is frustrated provide reassurance that what has been attempted is acceptable and continue with the next word. If the child forms a letter in reverse ask for the letter name and note the letter intended on the response sheet.

Scoring. Score each word separately. Each word has a possible total value of five points.

Some general guidelines for scoring are: (a) consider reversed letter formations as the letter intended if the letter intended was noted by the examiner during testing or if other samples of the child's writing indicate reversals are characteristic; (b) consider vowels as either short or long, whichever is accurate to phonetic representation; and finally, (c) consider *e* as the final letter of a word as /e/ when appropriate as in lady written *lade*.

Attribute value to each word as follows:

0 - nothing or response that does not capture either phonological or orthographic accuracy. Example: *red* written as *k*.

1 - one or more letters that capture one or more phonemes of the word, but the initial phoneme is *not* correctly represented. Example: *angry* written as *igre*.

2 - one or more letters that capture the initial phoneme, but no other part of the word is accurately represented. Examples: *teacher* written as *toge* and *thank* written as *themg*.

3 - two or more letters that contribute to capturing the initial phoneme and one or more other phonemes. There may be extra inaccurate letters. Examples: *went* written as wnt and *because* written as *bck*.

4 - preconventional spelling that captures the phonetic structure of the word. Example: said written as *sed* and *lady* written as *lade*.

5 - orthographically correct. Example: *people* written as *people*.

Record the value for each word and the total score on the record sheet. The total score is the sum of the word values. The total points possible is 100.

Test 8: Sentence Dictation

Rationale. Writing dictated sentences requires analysis of connected speech into single words and subsequently representation of those words with letters. Segmentation of speech into words, syllables, and finally phonemes has been shown to be developmental. Examination of performance on a sentence-writing task therefore, permits analysis of ability to segment and represent speech at several levels.

Description. This test is a part of the Dictation Test included in the Diagnostic Survey (Clay, 1985). The test consists of five forms, each of which requires the child to write one or two simple sentences dictated by the examiner. The test is administered without time limitations and with encouragement to write what is known when a child hesitates. The sentences are written on unlined paper and scored with respect to the number of phonemes represented.

Materials.

Stimulus sentences (Diagnostic Survey)
Response sheet
Pencil

Procedures.

Form A: I have a big dog at home. Today I am going to take him to school.
Form C: I can see the red boat that we are going to have a ride in.
Form E: The boy is riding his bike. He can go very fast on it.

The child should be comfortably seated for writing with the response sheet in clear view of the examiner. The following administration guidelines are presented in The Early Detection of Reading Difficulties (Clay, 1985, p.38).

Say: *I am going to read you a story. When I have read it through once I will read it again very slowly so that you can write down the words in the story.* Read the test sentences at normal speed. *Some of the words are hard. Say them slowly and think how you would write them.*

Dictate slowly. When the child comes to problem word, say: *You say it slowly. How would you start to write . . . What can you hear?*

If the child cannot complete the word say: *We'll leave that word.* Point to where to write the next word if this helps the child.

Support the child with comments like these to keep the child working at the task.

Use Form A for initial (October) testing, Form C for mid-point (January) testing, and Form E for final (April) assessment.

Scoring. Score one point for each phoneme accurately represented. Follow the scoring guidelines presented in The Early Detection of Reading Difficulties. The total points for each form is 37. Record the total value of the writing on the response sheet.

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Test 9: Word Recognition

Rationale. The relationship of phonemic awareness to reading is not yet fully understood. There is reason to believe that some degree of awareness is a necessary to begin reading and that more sophisticated awareness develops concurrently with reading. A measure of reading ability is, therefore, necessary to aid in gaining further insight into the prerequisite-consequence relationship. A test of word recognition is an easily administered measure from which reliable predictions regarding reading achievement can be made.

Description. The test requires the child to read the 35-item wordlist from the Word Attack subtest of the Woodcock-Johnson Tests of Achievement (1977). The list ranges from single letters to multi-syllabic words.

The initial assessment, conducted in a non-standardized format, makes allowance for non-readers at the beginning of grade one. That is, the items are presented one at a time on index cards. To lessen the risk of the child feeling defeat, the word cards are interspersed with picture cards to ensure some success if letters and words are unknown.

Materials.

35 stimulus word cards
5 stimulus picture cards

Woodcock-Johnson Psycho-educational Test Battery: Tests of Achievement

Response record

Procedures.

Wordlist:

1. O	10. to	16. his	26. piece
2. B	[turtle]	17. keep	27. shoulder
3. R	11. in	18. must	28. island
4. z	12. dog	19. got	29. whose
5. G	[fish]	20. part	30. announcer
6. h	13. not	21. light	31. ordinary
7. U	[book]	22. once	32. knowledge
[clown]	14. get	23. knew	33. bounties
8. is	[bird]	24. point	34. knead
9. go	15. had	25. whole	35. thermostat

Seat the child opposite the examiner at a small table. During the initial assessment, present the word and picture cards one at a time allowing the child as much time as desired to read each word. Say: *tell me what is on each card.*

During the final assessment, follow the standardized administration procedures prescribed in the Woodcock-Johnson (1977) manual. Use the standardized stimulus cards.

During both test administrations, acknowledge a child's attempt to "sound out" a word. If the child does not spontaneously attempt to pronounce the word in the usual manner of speaking, but continues with the elongated pronunciation, ask: *what is the word*? Discontinue after five consecutive errors. Record all responses. Recording may require phonetic representation of the child's utterance.

Scoring. Score responses according to the standardized procedures prescribed in the test manual. One point is scored for each word read correctly. Words not pronounced in the usual spoken form after decoding are considered incorrect. The total possible score is 35 points.

Test 10: Reading Connected Text

Rationale. The ultimate goal of all reading instruction is strategic and comprehensive reading of connected text. No assessment of reading ability would be complete without a measure of performance when reading connected text. That learning to read and reading contribute to the development of phonemic awareness has been argued successfully in previous research (Morais, 1987b; Perfetti et al., 1987). To extend understanding of the relationship between reading and gaining phonological sophistication, therefore, a test of reading connected text is included.

The test materials were chosen because of their resemblance to storybooks and classroom reading materials and consequently their likeness to the usual reading choices of young children.

Description. The test task requires the child to read orally from a series of leveled story booklets and to verbally recall the story in response to the examiner's prompt. The 1979 illustrated story booklets are those included in the testing packet prepared and published by Scott Foresman for Reading Recovery. The child is asked to read successive levels until 90% word recognition and satisfactory comprehension are no longer achieved. During the reading the examiner gives only whole word prompts. Recalls are unaided beyond the initial prompt.

Materials.

Testing packet of booklets prepared by Scott Foresman and Company, 1979. The titles, conventional levels, and assigned levels of the texts are presented in Table B-1.

Audio tape-recorder
Examiner copy of each text

Table B-1

Titles, Assigned Levels, and Conventional Levels of the Test Texts

Title	Level	
	Conventional	Assigned
A Bird Can Fly	Readiness	1
Hats	Readiness	2
At the Zoo	Preprimer One	3
The Table on the Porch	Preprimer One	4
A Bird and A Hippo	Preprimer Two	5
Dave's Tricks	Preprimer Two	6
Mr. Jumble at the Zoo	Preprimer Three	7
The Boat Ride	Preprimer Three	8
The Tub in the Yard	Primer	9
John and His Drum	Primer	10
Old Man Moss	Primer	11
George and the Porcupine	Grade One	12
The Hippo in the Hole	Grade One	13
A Man and a Dog	Grade Two	14
The Mouse and the Elephant	Grade Two	15
The Light of the Sun	Grade Three	16
No Children! No Pets!	Grade Three	17
Windows	Grade Four	18

Procedures. Note that administration differs from that used in Reading Recovery programs. Tape record the entire introduction, reading, and recall. Begin each recording with a clear statement of the child's name, class, and the date. In initial testing use performance on the word recognition test as a cue to select the level of text with which the child could be expected to be successful. Present the text to the child and say: *This book is called ___. I would like you to read this book to me. Read the title with me.* At this point read the title, pointing to each word and allowing the child to read with you. After reading the title with the child say: *When you are ready, go ahead and read the story to me.*

When unknown words are encountered by the child and assistance is requested or it is clear that the child is not intending to continue until prompted, tell the child the *word*. If the child makes an error and continues without recognition of having made the error, tell the correct *word* if (a) the error readily results in loss or change of meaning or (b) the word reappears in the text. Do not prompt decoding in any way other than telling whole words.

Circle, on the examiner's copy of the text, all words supplied for the child and any words mispronounced that were not corrected by the examiner. Also indicate all of the child's self-corrections by writing above the text the word first read preceded by @ sign. When the child completes reading, ask for recall of the story. Say: *If one of your friends* (or name a classmate if known) *asked you what this book is about, what would you say?* If the child is reluctant to offer a response, prompt with non-content requests such as, *tell me one thing about the story or tell me something you remember reading about.* When the child appears to have finished retelling the story, ask: *Is there anything else you might tell [friend]?* Do not allow the child to use the text or the pictures to aid recall.

Continue with each successive level of text until the child fails to read with 90% word recognition accuracy. If severe word recognition difficulties are encountered or there is any indication that the child is experiencing a sense of failure discontinue the child's reading at the next appropriate point in the text. Suggest that you will take a turn reading now. Read the rest of the story to the child and ask for recall in the same way as if the child had read the story independently. (This procedure is more likely to be necessary in the initial assessment than either the mid-point or final assessments. The point is not to leave the child with any sense of failure in meeting the examiner's expectations.) Indicate clearly on the examiners copy the point at which reading was discontinued.

Begin the mid-point and final testing with the next highest level after the one read successfully during the previous assessment. Continue in the same manner as during the initial assessment, presenting each successive level until the child achieves less than 90% word recognition accuracy and/or fails to have satisfactory comprehension. If there is reason from classroom observation or teacher report to believe that the child has made extensive gains over the past assessment, it is not necessary to read every successive level, so long as the highest level of 90% word recognition and satisfactory comprehension is clearly determined. See the scoring details for further information about determining the point at which to discontinue reading.

Scoring. Determine scores for both word recognition accuracy and comprehension (recall). Calculate word recognition accuracy by determining the arithmetical percentage of the total number of passage words recognized without prompting. The following specific guidelines apply to determining errors. *Self-corrections*, *omissions*, and *contractions* read as the component words are *not* counted as errors. *Additions are* counted as errors.

Determine comprehension as either "satisfactory" or "unsatisfactory". "Satisfactory" recall includes (a) indication to the examiner that the child followed the theme, characters, and when appropriate the plot, of the story to the extent that the gist of the text is understood and (b) some of the supporting detail is accurately associated with the story characters or action.

"Unsatisfactory" recall is characterized by (a) either total lack of retelling or (b) inaccurate recall of major events. Two examples of unsatisfactory recall are: "I don't know" or "I can't remember" with no elaboration following succeeding prompts and recall of central story events with gross inaccuracy such as added characters or unmentioned happenings. Note that the goal of the recall is an indication of the child's comprehension and not a test of the child's verbal expression.

In situations where the child's comprehension is satisfactory and the percentage of word recognition accuracy is at least 80% (but not 90%) test the next higher level of text. If 90% accuracy is achieved on the higher level, continue testing until accuracy again falls below 90%. For example, assuming satisfactory comprehension, a child who scores 87% on level 3 should be asked to read level 4. If 93% accuracy is achieved on level 4, then level 5 should be presented. If 86% accuracy is achieved on level 5, discontinue testing. That child's reading score would be level 4.

In the event that word recognition remains 90% or better and comprehension is unsatisfactory, continue to at least one level beyond the level at which comprehension became unsatisfactory. Keep in mind that the *primary goal* of this assessment is decoding and that the nature of the text and the context of the reading may influence performance.

The final score is the highest level of text read with 90% accuracy of word recognition and satisfactory comprehension.

APPENDIX C

PARENT QUESTIONNAIRE

Language Learning Outside of School

Please answer all questions and return this questionnaire in the attached envelope as soon as possible. All information will be kept confidential and used for research purposes only. If you have any questions, please call me. Thank you.

Child's Name _____

1. To the best of your recollection, which of the following apply to your child from age 0 to 2 years. Check as many as apply.

___ was sung to by you or another adult

___ sang simple songs (or parts of songs) with help

___ was read to (including nursery rhymes) by you or another adult

___ tried to repeat nursery rhymes with an adult: For example, "this little piggy" while getting dressed

___ repeated nursery rhymes (or parts of rhymes) by self

___ looked at books by self

___ liked to be read to

___ asked to be read to

___ asked for the same story again and again

___ engaged in imaginary play that involved talking such as with toy telephone

___ watched Sesame Street or other children's television programs

2. To the best of your recollection, which of the following apply to your child from age 2 to age 4 years? Check as many as apply.

___ sang simple songs (or parts of songs) with help

___ sang simple songs (or parts of songs) by self

___ listened to children's records or tapes

___ repeated nursery rhymes when given some help

___ repeated nursery rhymes (at least one verse) by self

___ looked at books by self

___ liked to be read to

___ asked to be read to

___ asked for the same story again and again

___ was read to

If so, how often?

___ once a day ___ more than once a day ___ once every 2 or 3 days

___ once a week ___ less than once a week

___ liked to draw with crayon, marker, or pencil

___ tried to make some letters by self

___ tried to copy letters (from books, or labels, or signs)

___ engaged in imaginary play that involved talking such as with puppets or toy telephone

___ watched Sesame Street or other children's television programs

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3. To the best of your recollection which of the following apply to your child between age 4 years and starting first grade? Check as many as apply.

___ sang simple songs (or parts of songs) by self

___ repeated nursery rhymes (at least one verse) by self

___ listened to children's records or tapes

___ looked at books by self

___ made up a story to go with the pictures when looking at a book

___ liked to be read to

___ asked to be read to

___ was read to

If so, how often?

___ once a day ___ more than once a day ___ once every 2 or 3 days

___ once a week ___ less than once a week

___ liked to draw with crayon, marker, or pencil

___ could identify only some letters

___ could identify all the letters

___ tried to copy letters or words (such as from signs or labels)

___ tried to make some letters or write words by self

If so, how often?

___ more than once a day ___ once a day

___ every 2 or 3 days ___ less than once a week

___ engaged in imaginary play that involved talking such as with puppets or telephone

___ watched Sesame Street or other children's television programs

___ could rhyme words

___ asked about words: For example, "what does that say?"

___ tried to read words, but was not always successful

___ could read some words (recognized every time they were seen)

___ could write some words

___ had some personal experiences with print such as signing birthday cards

___ borrowed books from a public library

4. Indicate the activities your <u>child now</u> engages in <u>outside of school</u>. <u>Check as many as apply</u>.

___ "plays school"

___ writes notes to friends or family (such as a letter to Grandma)

___ chooses to read for entertainment

If so, how often?

___ more than once a day ___ once a day

___ every 2 or 3 days ___ less than once a week

___ asks about words or sentences, "what does that say?"

___ makes up rhymes just for fun

___ "plays" with language such as trying to say words backwards or to say as many words as possible that rhyme or begin with a particular sound

If you can, please give an example of some recent "play" with words.

_____

_____

5. Which of the following would now be true of you (or another significant adult) and your child? Check as many as apply.

___ write notes to each other: For example, messages left on chalkboard "Have a good day".

___ write together sometimes (such as a thank you note or letter to friend or a story)

Please give an example of something you have written together recently.

_____

___ read together with the adult doing the reading

If so, how often?

___ more than once a day ___ once a day

___ every 2 or 3 days ___ less than once a week

___ read together with child and adult taking turns reading

If so, how often?

___ more than once a day ___ once a day

___ every 2 or 3 days ___ less than once a week

___ go to the public library together

___ child would see you reading (such as newspaper, magazine, letters)

If so, how often?

____ daily ____ weekly _____ less than once a week

___ talk together about something one of you has read

___ talk together about something one of you has written (including discussion of stories written at school.

Many children truly struggle with their early attempts to learn language while others seem to have few difficulties. If there is any comment about your child's early talk or reading or writing that you would like to share please add a note.